



A Great Adventure



COL Wm Forrest Crain

Lead, Integrate and Leverage
M&S for the Warfighter

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A Great Adventure

The M&S community is on the threshold of experiencing a Great Adventure of monumental proportions

- The SHAPE of recent events, efforts, advances and challenges have significant M&S implications.
- Current assessment of M&S needs and accomplishments lays the foundation to PREPARE for this major endeavor.
- The grand challenge to the M&S community is to RESPOND to this Great Adventure.

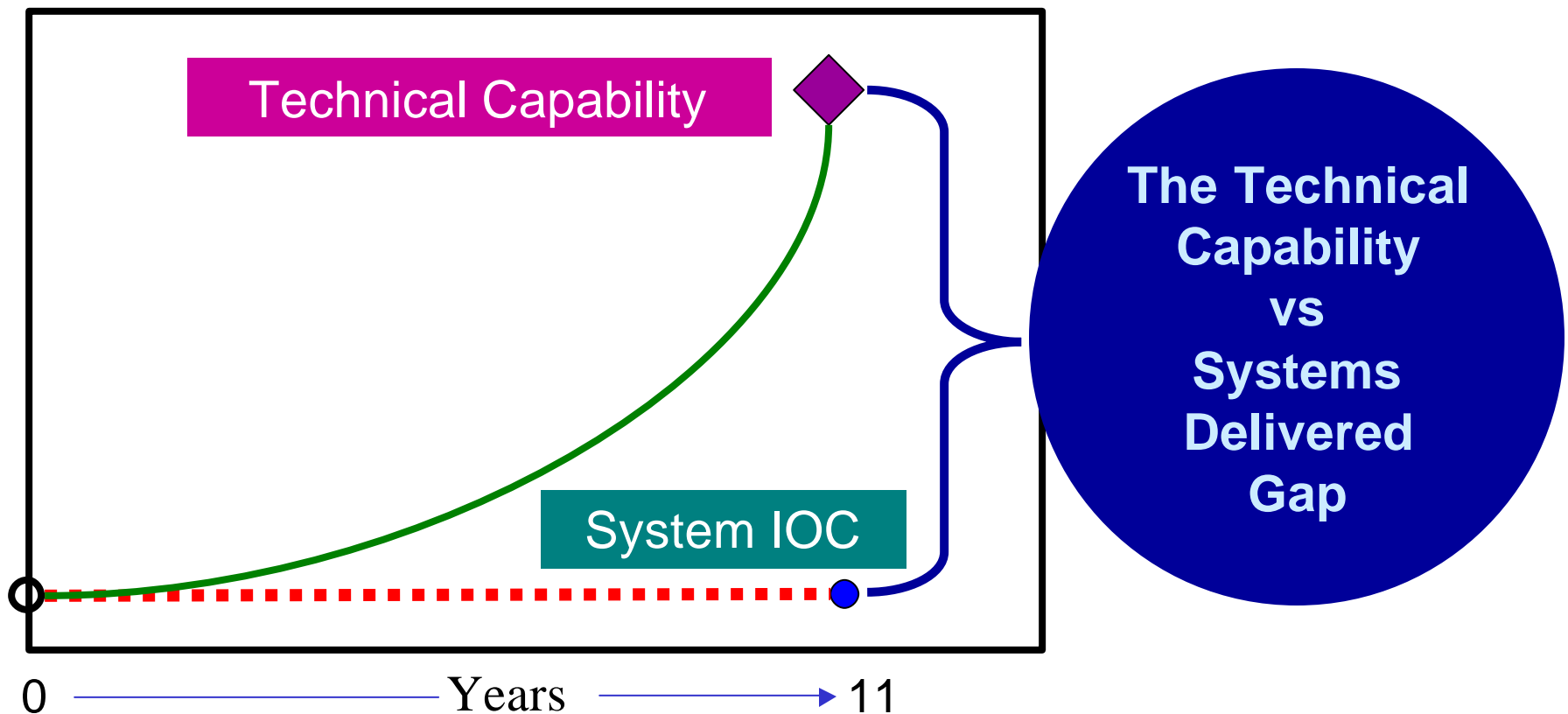


- **DoD Strategic Review is in full swing**
- **DoD S&T and R&D Investments - potential for major M&S role**
- **M&S technological advancements continue to grow exponentially**
- **M&S is a critical element to Joint & Service Visions of the future**
- **Demands on field commander's require M&S & decision support**
- **Current DoD M&S specific investments as much as \$3B by FY'07**

Significant Implications for M&S

Moore's Law versus the Average DoD Acquisition Systems Cycle

- **Moore's Law:** Capability doubles every year
- **DoD Acquisition Cycle:** 11 years (from program start to IOC)

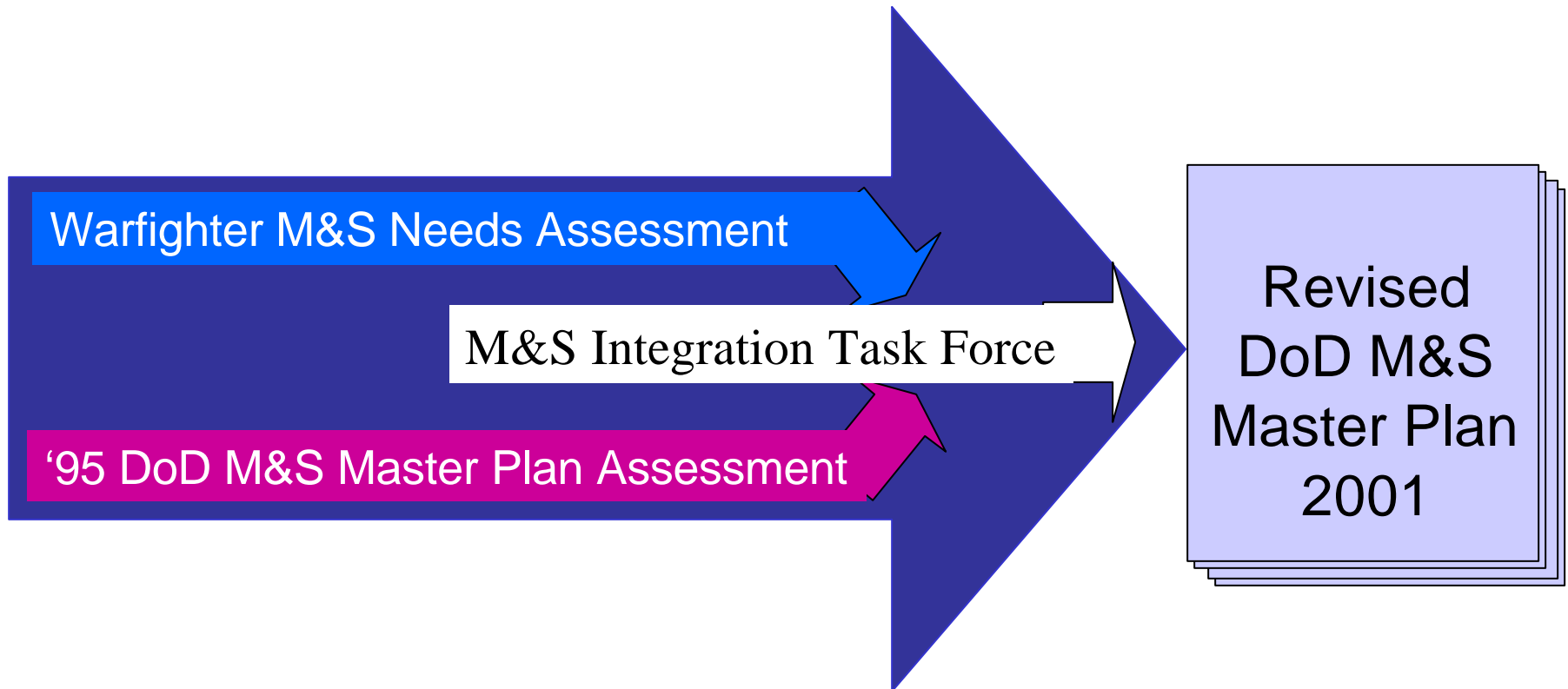


The Capability - Delivered "Gap" Continues to Widen



PREPARE

- Assessment of M&S needs and accomplishments nearing completion



- The “window of opportunity” is open - and the clock is ticking

The Foundation Is Being Laid for This Major M&S Endeavor



Warfighter M&S Needs

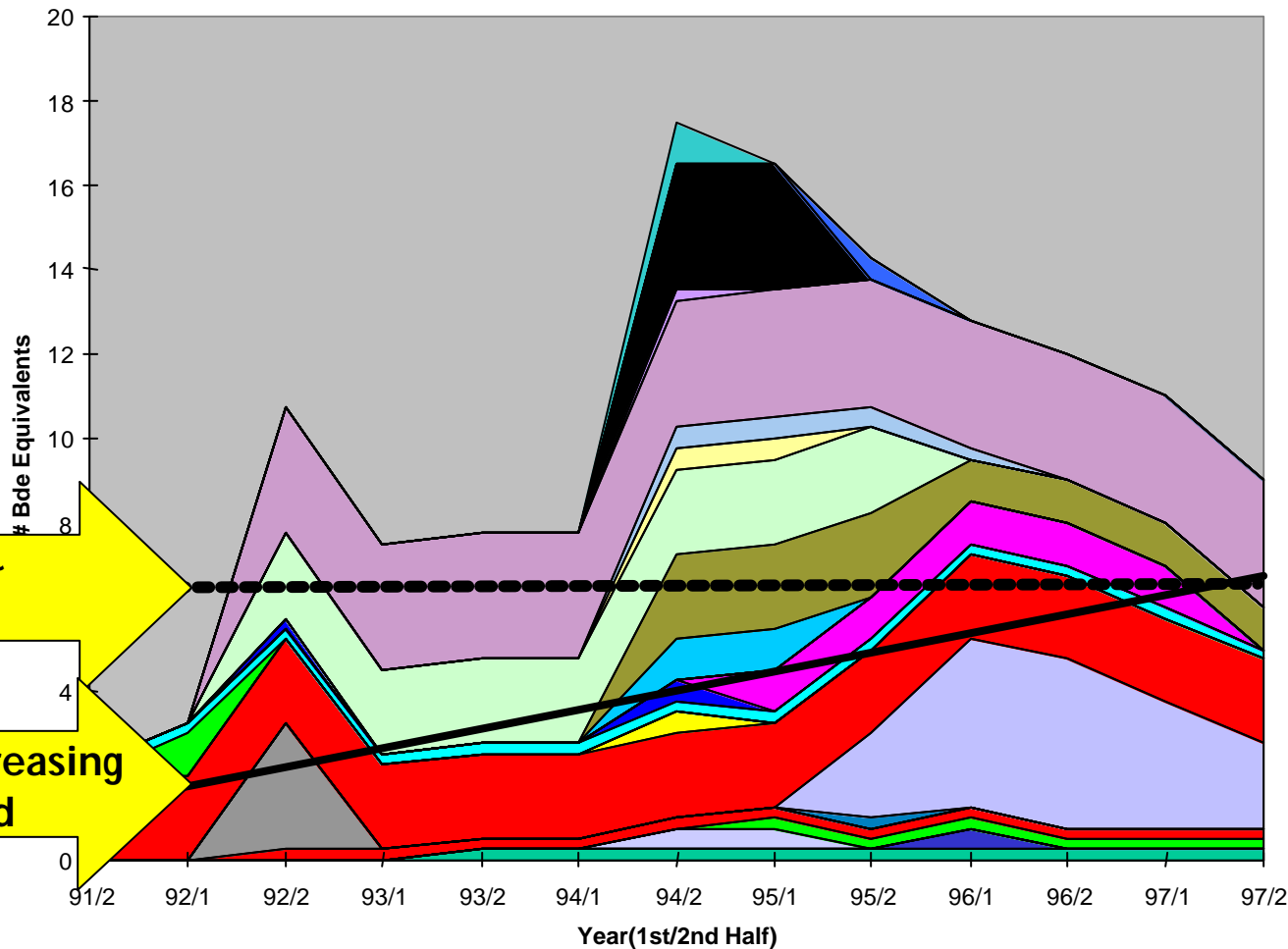
- **Surveyed regional and functional Commanders-in-Chief (CINCs) staffs, their Component Commands and selected service supporting commands.**
- **Some Highlights of Common Needs:**
 - **Multi-resolution and Composable Simulation Environments**
 - **Data Availability and Access**
 - **Operational Analysis Tools**
 - **Interoperability - Simulation to C4ISR**
 - **Human Behavior Modeling**
 - **Multi-level Security**
 - **M&S Education**

The Warfighter's Growing M&S Needs Continue to Outpace Delivery



OOTW Contingencies: '91-'97

US Army Brigade Equivalents Deployed





Asymmetric Threat/OOTW M&S Needs

- **TOP PRIORITY:**

- M&S tools today to train 4-star lead JTF for OOTW (**EUCOM**).
- CINC battle staffs currently lack a federated simulation that provides the detailed resolution needed in today's asymmetrical warfare environment (**JFCOM**).
- A standardized, collaborative and distributed crisis action planning tool for analyzing COA, especially in areas of OOTW and SASO (**PACOM, TRAC**).
- A model that can be used for missions disaster relief, refugee, peacekeeping, counter-drug and stability operations (**SOUTHCOM**).

- **Current Tools Are Inadequate:**

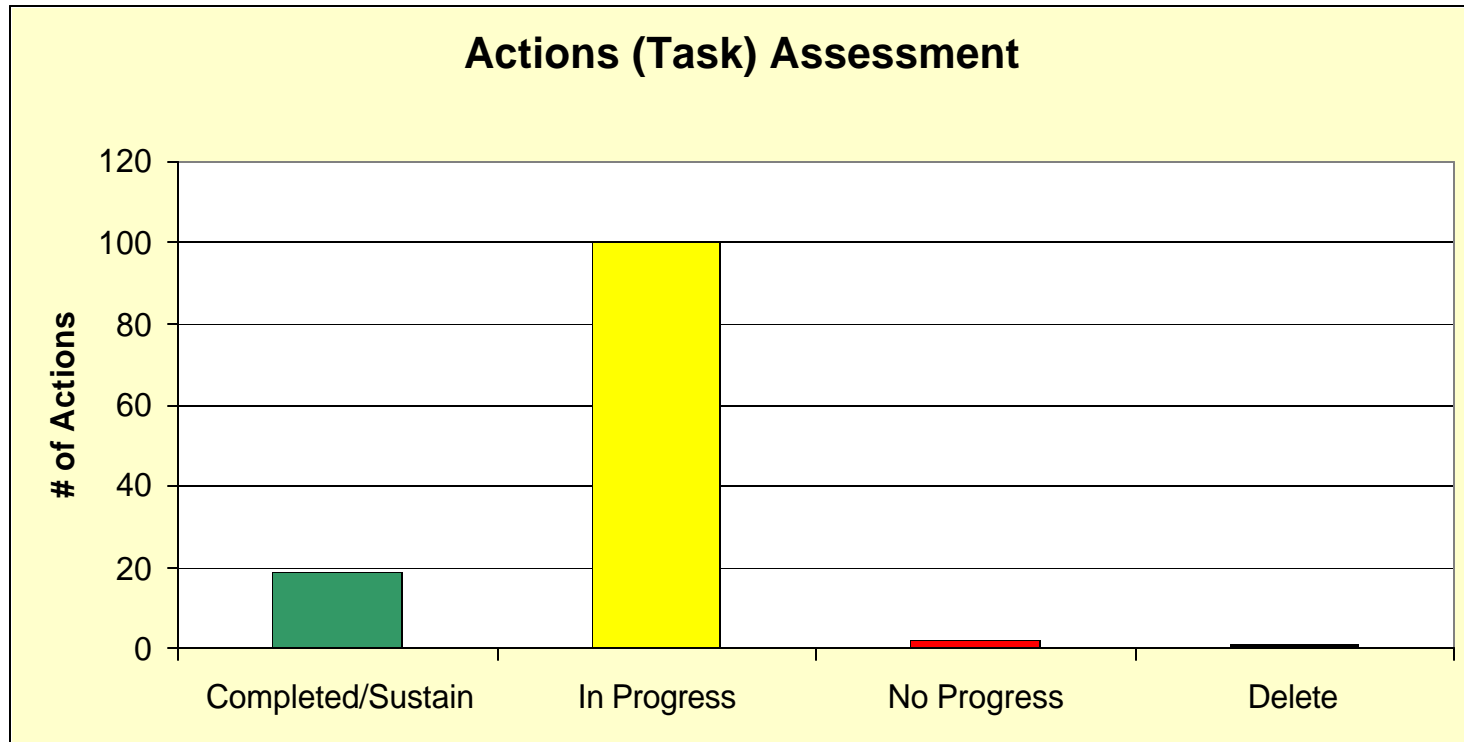
- Current models do not provide the capability to train to all missions ... particularly non-force-on-force, peacekeeping OOTW (**EUCOM**).
- M&S tools to conduct multinational training and COA analyses, especially in OOTW --- current tools inadequate (**PACOM**).
- SPECTRUM does not live up to its potential for non-engagement missions (**SOCOM**).

***Asymmetric Threat/OOTW: A Top Warfighter M&S Need --
Current tools don't cut it!***



'95 M&S Master Plan Assessment

- **Assessed:** 6 Objectives, 17 Sub Objectives & 115 Actions
- **Conducted:** 112 surveys and 47 interviews across the DoD

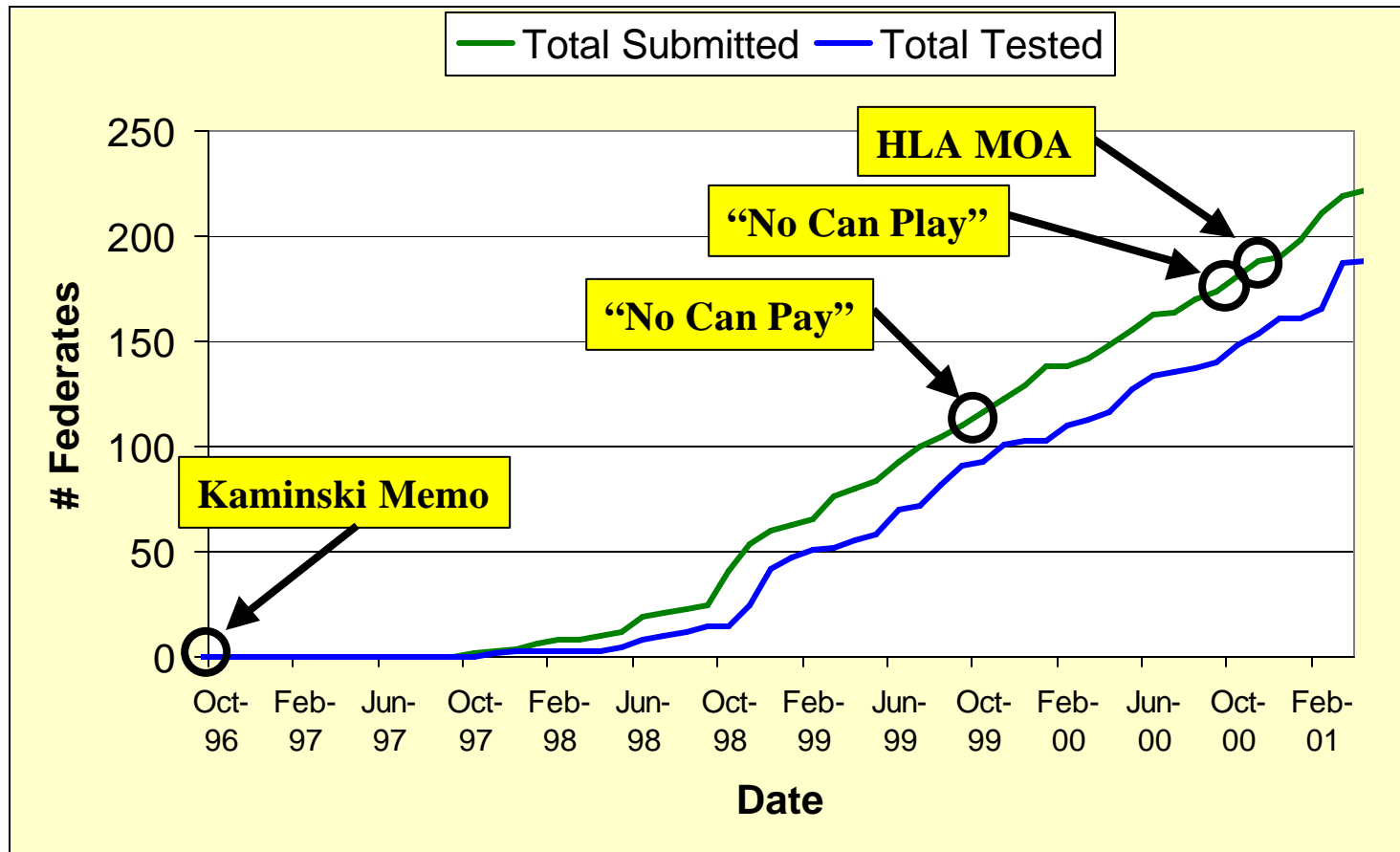


- **Progress recognized in all areas**
- **Greatest progress in creating Common Technical Framework (HLA)**
- **Least progress achieved in Human Behavior Representation**



HLA Compliance

- Over 25% of DoD simulations are HLA compatible
- The trend continues at a steady pace



DoD Simulation Interoperability - a Success Story in the Making



INTEGRATION TASK FORCE

1. Contributing Elements:

Input from ITF Representatives
MSWG Survey (6/29/00)
1995 MSMP Assessment
Warfighter Needs Assessment
Traditional Areas of Concern

2. Assessment Led to Initial Identification of 3 Priority Areas:

Integrated Natural Environment (INE)
Human Behavior Representation (HBR)
Command, Control, Communications,
Computers and Intelligence (C4I)

3. Additional Priority Areas for Assessment:

Multi-Level Security, Multi-Resolution Simulations
Standard Architectures, Advanced Concepts (MOUT, OOTW, etc.)
Logistics, Automated Decision Support

		TRADITIONAL AREAS OF CONCERN	WARFIGHTER ASSESSMENTS	MSWG 6/29/00	ARMY	NAVY	AIR FORCE
A. TECHNICAL							
REPRESENTATIONS							
HBR	HUMAN BEHAVIOR REPRESENTATIONS	X	X	X	X	X	
	INDIVIDUAL						
	GROUP						
ENVIRONMENT	INTEGRATED NATURAL ENVIRONMENT	X	X	X	X	X	
	SEDS	X	X	X	X	X	
	WORLDWIDE TERRAIN DATABASE		X				
	SCENARIO GENERATOR			X			
	JOINTSINTEGRATED BATTLESPACE (JB)				X		X
SYSTEMS	SYSTEM REPRESENTATION						
	C2						
	AIRSPACE SYSTEMS (CROSS DOMAIN)						X
ORDNANCE & PROCESS				X	X		X

Providing Integrating Function for Development of the Revised DoD MSMP



MSMP Objectives Crosswalk

1.0 Common Technical Framework			
1.1	HLA	49%	
1.2	CMMS	19%	
1.3	Data	7%	
2.0 Representation of the Natural Environment			
2.1	Terrain	6%	
2.2	Oceans	5%	
2.3	Atmosphere	4%	
2.4	Space	1%	
3.0 Representation of Systems			
		6%	
4.0 Representation of Human Behavior			
4.1	Individuals	4%	
4.2	Groups	3%	
5.0 M&S Infrastructure			
5.1	Field M&S Systems	6%	
5.2	VV&A	19%	
5.3	Repository	15%	
5.4	Communications	4%	
5.5	Operational Support	24%	
6.0 Share the Benefits			
6.1	Quantify Impacts	4%	
6.2	Education	9%	
6.3	Dual Use of M&S	5%	

1.0 M&S STANDARDIZATION AND REUSE		
1.1	Promote use of existing M&S standards and practices	
1.2	Leverage other standards and practices (DII COE, XML, etc)	
2.0 AUTHORITATIVE M&S REPRESENTATIONS		
2.1	Environment	
2.2	Systems	
2.3	Human Behavior	
2.4	VV&A	
2.5	Cross Domain Interactions	
3.0 SUPPORTING M&S INFRASTRUCTURE		
3.1	Security	
3.2	Communications and Networking	
3.3	Computing	
3.4	Human - Simulation Interfaces	
4.0 READY ACCESS TO M&S INFORMATION		
4.1	Education and Training	
4.2	M&S Information	
4.3	Repositories (MSRR)	
4.4	Technology Transfer (Dual Use)	
4.5	Quantify Impacts	
5.0 IMPROVE THE USABILITY OF M&S		
5.1	M&S Support Tools	
5.2	Maintain awareness of M&S Needs & Requirements	
5.3	Improve the Acquisition and Fielding of M&S Systems	
5.4	Automation of M&S Systems	
5.5	Embedded M&S in End-User Systems	

Note: Percentages above reflect degree completion of the sub-objectives as reported in the 1995 M&S Master Plan Baseline Assessment



Tentatively Proposed New sub-objective

The Plate Keeps Getting Fuller



That's Why We're Here!

- Focus M&S efforts to meet identified Warfighter needs
- Exploit M&S S&T initiatives to minimize “The Gap”
- *Leverage inter-governmental M&S investments*
- *View the Challenge as a TRIAD: M&S-Data-People*
 - *User VV&A*
 - *User Interoperability*
- **Specific Areas:**
 - Asymmetric Threats/OOTW
 - C4ISR to Simulation
 - Multi Level Security

Common Standards -
The Means to
M&S-Data-People
Interoperability &
Reuse

A Great Adventure is on the Horizon